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Abstract of the Disclosure

An optical waveguide is provided. Specifically, a low loss isotopic optical waveguide that comprises a core region having a first refractive index profile by virtue of comprising a first mixture of isotopes of at least one element, and a cladding region having a second refractive index by virtue of comprising a second mixture of isotopes of said at least one element, is provided. Preferably said at least one element comprises silicon and/or oxygen. The optical waveguide may further include germania dopant in the core. A method of preparing the optical waveguide of the present invention is also provided.